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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,518	09/14/2005	Stefan Groetsch	12406-109US1/P20020639 US	1431
26161	7590	02/13/2008	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			RODRIGUEZ, ARMANDO	
			ART UNIT	PAPER NUMBER
			2828	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/522,518	<b>Applicant(s)</b> GROETSCH, STEFAN	
	<b>Examiner</b> ARMANDO RODRIGUEZ	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 12-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12--17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed November 26, 2007 have been fully considered but they are not persuasive.

Regarding applicant's arguments on page 7 pertaining to positioning the laser bar away from the edge of the cooler, thereby increasing the cross section through which the heat of the laser flows and the length of the microstructure region is greater than that of the laser bar. None of the claims recite, imply or suggest such limitations thereby applicant's arguments are moot. Applicant's attention is directed to MPEP 2111.01 II. IT IS IMPROPER TO IMPORT CLAIM LIMITATIONS FROM THE SPECIFICATION. "Though understanding the claim language may be aided by explanations contained in the written description, it is important not to import into a claim limitations that are not part of the claim."

Regarding applicant's argument pertaining to the position of the lens and "no corresponding extra attaching part is needed with the device". It would be obvious to any person having ordinary skill in the art, when rearrangement of the laser relative to the collimating lens will be required to be rearranged or repositioned. Thereby, when the laser is moved back a predetermined distance the collimating lens will be moved the same distance. Furthermore, applicant's attention is directed to MPEP 2144.04 V B. Making Integral In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with

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a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, "that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice."). Therefore, in the instant application it would be an obvious engineering choice to use a single surface instead of the two integrated surfaces as illustrated in the figure of APA.

Regarding applicant's argument on page 9 pertaining to no evidence to suggest that a person of skill in the art would modify prior art devices to increase impact resistance. Applicant's attention is directed to column 5 lines 16-18, where the cited prior art of Spaeth discloses the use of an intermediate support (3) having a high modulus of elasticity and Hall discloses in column 1 lines 28-32 discloses the diamond composite material having a high modulus of elasticity, which will suggest to a person of ordinary skill in the art to modify the prior art devices.

Regarding applicant's arguments on page 9 pertaining to diamond having good thermal conductivity but poor electrical conductivity, which is well known in the art. However, the Hall cited prior art discloses a diamond composite material composed of diamond and cobalt, which applicant has not addressed.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-8, 12-15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of Spaeth (US 5,812,570).

Regarding claims 1, 12, 13, 14, 15, 16,

APA illustrates in figure 2 a semiconductor component (12), a cooling element (20), cooling channels (26), one region microstructures (32), as illustrated the semiconductor component overlaps the cooling channels. Page of the specification discloses the cooling element made by etching copper foils.

APA does not disclose an intermediate support disposed between the semiconductor component and the cooling element.

Spaeth illustrates in figure 1 a semiconductor component (1), a cooling element (7) and an intermediate support (3) disposed between the semiconductor component (1) and the cooling element (7), column 4 lines 40-50 discloses the intermediate support (3) compensating for mechanical stresses due to differing thermal expansion between the semiconductor component (1) and the cooling element (7).

APA figure 2 does illustrate a collimating lens (62), but does not illustrate the lens on a common surface of the cooling element.

However, in accordance with MPEP 2144.04 VI C Rearrangement of parts, in the present application rearrangement of the collimating lens is considered an obvious design choice because the collimating regardless of its position would provide the same function of collimating the beam, thereby the positioning of the lens does not modify the operation of the claimed invention.

Therefore, it would have been obvious to a person having ordinary skill at the time of the invention to combine the intermediate support (3) of Spaeth with the device of APA in figure 2, because it would reduce mechanical strains due to differing thermal expansion, as suggested by Spaeth in column 4 lines 40-50.

Regarding claims 2, 8,

In column 4 lines 40-50 Spaeth discloses the intermediate support (3) made of molybdenum, which does have a high modulus of elasticity.

Regarding claim 4,

Spaeth discloses in column 4 lines 48-50 the use of molybdenum for the material of the intermediate support (3), which will match the semiconductor component (1).

Regarding claims 5-7,

Column 4 lines 2-4 discloses the use of AuSn solder for connecting the semiconductor component (1) to the intermediate support (3).

Column 5 lines 16-18 discloses the use of AuSn for connecting the intermediate support (3) to the cooling element (7).

Claims 3, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of Spaeth (US 5,812,570) as applied to claim 1 above, and further in view of Hall (US 4,525,178) and Razeghi et al (US 5,012,476).

Regarding claim 3,

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Hall is silent as to the diamond having a thermal conductivity of about 1.5 times higher than copper.

However, it is well known in the art for diamond to have a thermal conductivity twice as great as that of copper, as described in Razeghi et al column 3 lines 55-58.

Regarding claim 9,

In column 5 lines 16-18 Spaeth suggest and implies the use of an intermediate support (3) having a high modulus of elasticity.

Spaeth does not explicitly disclose the intermediate support made of a diamond composite material.

Hall discloses in column 1 lines 28-32 a diamond composite material, which has a high modulus of elasticity and column 8 lines 37-45 discloses the diamond composite material as including diamond and cobalt.

Therefore, it would have been obvious to a person of ordinary skill in the art to combine the diamond composite material of Hall with the APA of figure 2, due to its high modulus of elasticity.

Hall is silent as to the diamond having a thermal conductivity of about 1.5 times higher than copper.

However, it is well known in the art for diamond to have a thermal conductivity twice as great as that of copper, as described in Razeghi et al column 3 lines 55-58.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of Spaeth (US 5,812,570) and Hall (US 4,525,178).

Regarding claim 17,

APA illustrates in figure 2 a semiconductor component (12), a cooling element (20), cooling channels (26), one region microstructures (32), as illustrated the semiconductor component overlaps the cooling channels. Page of the specification discloses the cooling element made by etching copper foils.

APA does not disclose an intermediate support disposed between the semiconductor component and the cooling element.

Spaeth illustrates in figure 1 a semiconductor component (1), a cooling element (7) and an intermediate support (3) disposed between the semiconductor component (1) and the cooling element (7), column 4 lines 40-50 discloses the intermediate support (3) compensating for mechanical stresses due to differing thermal expansion between the semiconductor component (1) and the cooling element (7).

In column 5 lines 16-18 Spaeth suggest and implies the use of an intermediate support (3) having a high modulus of elasticity.

Spaeth does not explicitly disclose the intermediate support made of a diamond/metal matrix of at least one metal selected from copper, cobalt and aluminum.

Hall discloses in column 1 lines 28-32 a diamond composite material, which has a high modulus of elasticity and column 8 lines 37-45 discloses the diamond composite material as including diamond and cobalt.



Therefore, it would have been obvious to a person having ordinary skill at the time of the invention to combine the intermediate support (3) of Spaeth with the device of APA in figure 2, because it would reduce mechanical strains due to differing thermal expansion, as suggested by Spaeth in column 4 lines 40-50 and to use the diamond composite material of Hall, due to its high modulus of elasticity.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ARMANDO RODRIGUEZ whose telephone number is 571-272-1952. The examiner can normally be reached on 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MINSUN HARVEY can be reached on 571-272-1835. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ARMANDO RODRIGUEZ/  
Primary Examiner  
Art Unit 2828

AR